

## University of Groningen

### Young eyes for elderly people

Gaalen, Kim Warda van

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2009

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Gaalen, K. W. V. (2009). *Young eyes for elderly people: a clinical comparison of spherical and aspheric intraocular lenses*. s.n.

**Copyright**

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

**Take-down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

*Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.*

# **Young Eyes for Elderly People**

A clinical comparison of spherical and aspheric  
intraocular lenses

Kim W. van Gaalen

The studies described in this thesis were performed at the Laboratory of Experimental Ophthalmology, Department of Ophthalmology, University Medical Center Groningen, University of Groningen, Hanzeplein 1, P.O.box 30.001, 9700 RB, Groningen, The Netherlands. The study described in this thesis was supported by SenterNovem Dutch grant: “Young eyes for elderly people” (IS 043081).

Financial support for the publication of this thesis was kindly provided by:

AMO Groningen BV  
Prof. Mulder Stichting  
School of Behavioral and Cognitive Neurosciences  
De Rijksuniversiteit Groningen

ISBN: 978-90-367-3957-3

Copyright © 2009 K.W. van Gaalen

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronical, mechanical, photocopying, recording, or otherwise, without the permission of the author and the publisher holding the copyright of the pulished articles.

Printed by: Grafic Elements b.v.

Cover: Eagle owl, photo Paul van Gaalen



**rijksuniversiteit  
 groningen**

# **Young Eyes for Elderly People**

**A clinical comparison of spherical and aspheric  
 intraocular lenses**

## **Proefschrift**

ter verkrijging van het doctoraat in de  
 Medische Wetenschappen  
 aan de Rijksuniversiteit Groningen  
 op gezag van de  
 Rector Magnificus, dr. F. Zwarts,  
 in het openbaar te verdedigen op  
 woensdag 14 oktober 2009  
 om 13.15 uur

door

**Kim Warda van Gaalen**

geboren op 17 juni 1980  
 te 's-Gravenhage

**Promotor:** Prof. dr. A.C. Kooijman

**Copromotores:** Dr. N.M. Jansonius  
Dr. S.A. Koopmans

**Beoordelingscommissie:** Prof. dr. H.J. Busscher  
Prof. dr. R.F. Guthoff  
Prof. dr. G. van Rij

I'm Just Moving Clouds Today, Tomorrow I'll Try Mountains  
(Asleigh Brilliant)



## Table of contents

Chapter 1	General introduction.....	9
<b>Contrast sensitivity and spherical aberration</b>		
Chapter 2	Relationship between contrast sensitivity and spherical aberration: Comparison of 7 contrast sensitivity tests with natural and artificial pupils in healthy eyes.....	29
	<i>Journal of Cataract and Refractive Surgery 2009; 35:47-56</i>	
<b>Optical performance of spherical and aspheric intraocular lenses</b>		
Chapter 3	Clinical comparison of the aspheric Tecnis ZA9003 and the spherical Sensor AR40e intraocular lenses: Spherical aberration, contrast sensitivity, depth of focus, myopic shift and straylight.....	49
	<i>Accepted for publication in Journal of Cataract and Refractive Surgery</i>	
Intermezzo	Optical performance and patients' satisfaction one year after implantation of the aspheric Tecnis ZA9003 intraocular lens and the spherical Sensor AR40e intraocular lens .....	71
Chapter 4	Depth of focus of the aspheric Tecnis ZA9003 and the spherical Sensor AR40e intraocular lenses: A comparison of two different definitions.....	97
Chapter 5	Comparison of the optical performance of eyes with aspheric foldable intraocular lenses, spherical foldable lenses and rigid PMMA lenses: Higher-order aberrations, contrast sensitivity, depth of focus, myopic shift and straylight .....	113
	<i>Submitted for publication to Journal of Refractive Surgery</i>	
<b>Straylight in pseudophakic eyes</b>		
Chapter 6	Straylight measurements in pseudophakic eyes with natural and dilated pupils: A one-year follow-up.....	131
	<i>Submitted for publication to Journal of Cataract and Refractive Surgery</i>	
Chapter 7	General discussion .....	143
<b>Nederlandse samenvatting .....</b>		151
<b>Dankwoord .....</b>		159
<b>Curriculum Vitae.....</b>		163
<b>Publications .....</b>		165



